



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD / CWB

07095PKP.04c

DATE: July 26, 2004
NPDES PERMIT NO.: HI 0021824

**RATIONALE: APPLICATION FOR NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO
WATERS OF THE UNITED STATES**

FACILITY: GROVE FARMS WATER TREATMENT FACILITY

PERMITTEE: GROVE FARM PROPERTIES, INC.

FACILITY ADDRESS

Lihue, Oahu, Hawaii
TMK: (4) 3-8-002:002

PERMITTEE MAILING ADDRESS

P.O. Box 2069, Puhi Rural Branch
Lihue, Hawaii 96766
Contact: Mr. Michael Furukawa
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PERMIT STATUS

The Department of Health (Department) originally received the NPDES permit application on June 30, 2003. The Department requested additional information in a letter, dated September 26, 2003, and the requested information was received on December 12, 2003.

The Director of Health (Director) proposes to issue a permit to discharge to the waters of the United States until five (5) years from the date of issuance, and has included in the draft permit those terms and conditions which the Director has determined are necessary to carry out the provisions of the Federal Water Pollution Control Act (P.L. 92-500), Federal Clean Water Act of 1977 (P.L. 95-217) and Hawaii Revised Statutes, Chapter 342D.

FACILITY OPERATION AND LOCATION

Grove Farm Properties, Inc. ("Permittee"), proposes to discharge wastewater associated with the operation of the Grove Farm Water Treatment Facility ("facility") located in Lihue, Kauai, Hawaii. The facility will treat water from the Kapaia Reservoir to drinking water quality. The facility will have an initial firm capacity of 3.0 million gallons per day (mgd) and an average capacity of 4.0 mgd.

The raw water will be pumped from Kapaia Reservoir and passed through strainers. After being injected with aluminum chlorohydrate (ACH) for coagulation and sodium hydroxide (NaOH) for pH adjustment, the raw water will then pass through a static mixer to induce coagulation. The coagulated water will then enter one of four flocculation tanks where gentle mixing and aggregation will induce the formation of pin-sized floc. The floc is then removed by membrane units and the treated water (permeate) will be injected with sodium hypochlorite for disinfection prior to entering the chlorine contact tank. The targeted finished water chlorine residual will be 0.5 mg/l in order to maintain a minimum chlorine residual concentration of 0.2 mg/l in the water entering the distribution system.

Discharges associated with this treatment process include reject water, strainer backwash water, maintenance clean water, recovery clean water, flocculation tank drain/overflow water, chlorine contact tank drain/overflow water, finished water sample drain water, and raw water intake cleaning waste water.

All discharges will be discharged to the receiving water named Kapaia Reservoir, through Outfall Serial No. 001 at Latitude 22°01'12" N, Longitude 159°23'47" W.

RECEIVING WATER DESIGNATION

The receiving water, Kapaia Reservoir, is classified by the Department as Class 2 Inland Waters under Hawaii Administrative Rules (HAR), Section 11-54-05. It is the objective of Class 2 waters to protect their use for recreational purposes, propagation of fish and aquatic life, and agricultural and industrial water supplies, shipping, navigation and propagation of shellfish.

DESCRIPTION OF THE DISCHARGE

A. Types of Wastewater Discharged into Detention Basin

1. Reject Water

Approximately 8 to 15 percent of the raw water that is pumped into the facility is not expected to be treated and will be discharged as reject water. The volume of reject water is projected to be approximately 260,000 gpd and should be of the same quality as the raw (reservoir) water, which contains Natural Organic Matter (NOM).

2. Strainer Backwash Water

The interval between backwashing the strainer is not known at this time however the volume should not exceed 10,000 gallons per day. The strainer backwash water will contain NOM and be discharged to the detention basin.

3. Maintenance Clean Water

Maintenance clean operations consist of draining the membrane tank and backpulsing chlorine at a dosage rate of 100 mg/l through the membrane fibers. The pipes and membrane will then be flushed with a final backpulse without chlorine. The 1,200 gallons of water generated will then be neutralized with sodium bisulfite and sodium hydroxide and will be discharged into the detention basin. Maintenance cleans will be performed daily on each membrane and the total discharge per day will be 43,500 gallons.

4. Recovery Clean Water

Recovery clean operations consist of draining the membrane tank and pumping either sodium hypochlorite (NaOCl) or citric acid solutions through the membrane. The membrane will be soaked from four to six hours and the solution will be neutralized using sodium bisulfate for NaOCl recovery cleans and sodium hydroxide for NaOCl and citric acid recovery cleans. The water will be circulated throughout the tank to ensure proper neutralization and discharged to either the detention basin or a pumper truck for off-site disposal. Each recovery clean operation generates 19,350 gallons of wastewater and is performed two (2) to three (3) times a year for each membrane tank.

5. Flocculation Tank Drain/Overflow Water

As part of a weekly membrane integrity test, approximately 1,000 gallons of water (4,000 gallons total for four membrane tanks) will be pumped out of the flocculation tank. The water will contain pin-sized floc and discharged to the detention basin.

If the flocculation tank will be drained for cleaning or maintenance purposes, approximately 6,855 gallons of water containing pin-sized floc will be discharged to the detention basin. This situation is not expected to occur. In emergency situations, the flocculation tank may overflow and discharge to the detention basin.

6. Chlorine Contact Tank Drain/Overflow Water

Water in the chlorine contact tank may be drained to the detention basin for cleaning or maintenance purposes or it may overflow in the event of an emergency. Both the drain and overflow pipes discharge to the detention basin.

7. Finished Water Sample Drain Water

The finished water will be analyzed for pH, chlorine residual and turbidity. The drain water from the analyzers will discharge directly into the detention basin and the flow is expected to be less than 1,000 gallons per day.

8. Raw Water Intake Cleaning Waste Water

The perforated raw water intake line will be cleaned using compressed air approximately one to two times per year. After the cleaning, the raw water pumps will be operated for a period of time to pump out any biological matter that may have been removed from the intake line. This water will be conveyed to the detention basin prior to reaching the facility's strainers. Approximately 10,000 gallons is expected to be generated during this process.

B. Description of the Detention Basin

The detention basin will be an unlined, earthen basin, with side slopes of 2:1 and will be able to contain approximately 280,000 gallons. The basin bottom will slope to a five-foot square sump in the middle of the basin. A submerged outlet will draw water out of the detention basin in a zone which will minimize the withdrawal of floatables and algae, as well as settled solids. A 12-inch outlet line will convey the decant water from the detention basin to an outlet headwall, located downstream of the intake to prevent the decant from being recycled through the treatment process. Settled solids within the detention basin will be periodically removed using a pumper truck and the removed solids will be dewatered and disposed at an off-site location.

Description of Discharge from Detention Basin

PARAMETER	ESTIMATED MAXIMUM DAILY CONCENTRATIONS	ESTIMATED AVERAGE DAILY CONCENTRATIONS
Biochemical Oxygen Demand	1,500 mg/l	---
Chemical Oxygen Demand	1,500 mg/l	---
Total Organic Carbon	750 - 752 mg/l	---
Temperature - Winter (°C)	75° F	65° F
Temperature - Summer (°C)	75° F	70° F
pH	7.6	7.0
Color	30 ACU	25 ACU
Fecal Coliform	220 mpn/100 ml	13 mpn/100 ml
Total Barium	4.4 µg/l	4.15 mg/l

PARAMETER	ESTIMATED MAXIMUM DAILY CONCENTRATIONS	ESTIMATED AVERAGE DAILY CONCENTRATIONS
Total Chromium	< 5 mg/l	< 5 mg/l
Total Aluminum	543 mg/l	526 mg/l
Total Residual Chlorine	0.12 mg/l	0.05 mg/l
Total Suspended Solids	< 10 mg/l	< 10 mg/l
Bromide	0.037 mg/l	0.041 mg/l
Total Copper	2.8 µg/l	< 2.0 µg/l

PROPOSED DETERMINATIONS

A. Discharge Limitations and Monitoring Requirements

The proposed effluent limitations and monitoring requirements specified in Part A of the draft permit are based on HAR, Chapter 11-54, Water Quality Standards and best professional judgement.

The parameters required to be analyzed are consistent with those that may be attributed to the water treatment process through the introduction of chemicals to enhance the water treatment process, water treatment equipment cleaning, or the concentration of pollutants already present in the source water.

B. Whole Effluent Toxicity Limitations and Monitoring Requirements

The proposed whole effluent toxicity limitation and monitoring requirements are incorporated into Parts A and B of the draft permit in accordance with 40 CFR Section 122.44(d) as published in the Federal Register on June 2, 1989. The whole effluent limitation enforces basic provisions of HAR, Section 11-54-04 and are listed in Section 1 of the Standard NPDES Permit Conditions.

The draft permit requires the Permittee to conduct whole effluent toxicity testing on the discharge from the detention basin because of the presence several toxic pollutants. The proposed whole effluent toxicity limitation of 80% survival in 100% effluent is pursuant to HAR, Section 11-54-04(b)(4)(B).